Circuit-to-Packet Workshop, Revision 26A

COURSE OVERVIEW

This three-day, intermediate-level course provides a comprehensive introduction to the Circuit-to-Packet (CTP) Series access products and their use cases. Participants will explore the available hardware options and interfaces and learn the essential steps for initial CTP configuration. The course offers in-depth coverage of both local and remote access methods, detailing the configuration options for each interface type and encapsulation methods. It also explains the various node and circuit timing and synchronization settings, along with the role and configuration of jitter buffers. Troubleshooting techniques for circuits are included to help participants diagnose and resolve common issues. Additionally, the course introduces the CTPView network management application, covering its capabilities for configuration, software upgrades, database management, monitoring, bit error rate test (BERT), loopbacks, and performance graphing.
The CTP devices used in this course run on CTPOS version 9.2R2, and the CTPView management platform runs on version 9.3R2.

COURSE LEVEL

Circuit-to-Packet Workshop is an intermediate-level course.

AUDIENCE

This course benefits individuals responsible for configuring and monitoring devices running the CTP operating system (CTPOS).

PREREQUISITES

- Basic understanding of IP networking.
- Knowledge of Ethernet fundamentals, and the Layer 2 and Layer 3 concepts.
- Basic understanding of time-division multiplexing (TDM), T1E1, DS0 grooming, and Serial circuits.
- Knowledge on encoding techniques such as NRZ, AMI, BZ8S, and other relevant techniques.
- Basic understanding of clocking, timing, and synchronization fundamentals.
- Basic understanding of Linux system administration.

RELATED JUNIPER PRODUCTS

CTP150 Series, CTP2000 Series, CTPView

OBJECTIVES

- Define CTP Series products and explain their role in integrating legacy circuit-based systems with modern IP/MPLS networks.
- Explain the drawbacks of legacy end devices and applications and the benefits of transitioning to packet-based transport using CTP.
- Describe common CTP application use cases and articulate how CTP provides value to business-critical services.
- Describe the hardware architecture and chassis components of the CTP150 and CTP2000 platforms, including processor generations and supported serial modules.
- Perform initial CTP system configuration, including network and management access methods.
- Configure and explain Ethernet segregation for circuit and management traffic, including associated caveats and limitations.
- Describe and manage CTP security features using the Security Profile Management Menu, including user roles, access levels, password policies, secure logs, login banners, security levels, and port forwarding.
- Explain the encapsulation methods used by CTP to transport legacy traffic over IP networks and the importance of DiffServ code point (DSCP) and QoS for CTP bundles.
- Provision serial circuits and configure circuit parameters within the CTP system.
- Configure CTP bundles for serial circuits, including T1 and E1.
- Configure Circuit Emulation Service over Packet-Switched Network (CESoPSN) bundles, including advanced scenarios such as hairpinning, and apply platform-specific limitations.
- Configure analog voice port interfaces and identify their operational caveats and limitations.
- Monitor, manage, and troubleshoot CTP devices using CTPView, including performance monitoring, jitter and packet loss analysis, synchronization, BERT, and operational troubleshooting.

COURSE CONTENTS

DAY 1

Module 01: CTP Introduction

- Explain the drawbacks of legacy end devices and applications
- Describe the different serial data applications where CTP is used

Module 02: CTP Hardware–150 and 2000 Series

- Explain the hardware and chassis components of CTP150 Series
- Explain the hardware and chassis components of CTP2000 Series

Module 03: CTP Hardware–Interface Modules

- Identify the different generations of CTP processor modules
- Provide an overview of different interface modules

Module 04: CTP Initial Configuration

- Explain how to perform Firstboot
- List and perform initial system configuration tasks

Module 05: CTP Additional Configuration

- Define VLAN configuration
- Explain the SNMP configuration options
- Describe the process of setting the NTP timezone on CTP

Module 06: CTP Ethernet Segregation

- Describe the configuration for Ethernet segregation on CTP devices
- Verify the Ethernet segregation parameters
- Define the caveats of Ethernet segregation

Module 07: Security Profile Menu

- Describe the user types and security levels within CTP secure access
- Explain user management in the CTPOS
- Explain password management in the CTPOS
- Define log management in CTPOS
- Define login banner in CTPOS
- Describe the security level in CTPOS
- Define management port forwarding in CTPOS

Module 08: CTP Encapsulation

- Define the available options for CTP encapsulation
- Explain the SAToP encapsulation
- Explain the CESoPSN encapsulation
- Define PWE3
- Define DSCP classes and service type settings

DAY 2

Module 09: Circuit Provisioning

- Explain the provisioning of serial circuits and T1E1 circuits
- Explain the provisioning of daughter card circuits
- Describe the encoding techniques used in the CTP
- Define TRANS encoding
- Define TRANS8 encoding

Module 10: CTP Bundle Serial Configuration

- List the different CTP modules that support serial circuit configuration

- Explain how to configure a bundle on serial circuit
- Explain how to configure port settings for the bundle configuration
- Explain how to configure clock settings inside port configuration of the bundle
- Explain how to activate and query a bundle

Module 11: CTP Bundle Configuration–T1 and E1

- List the different CTP modules that support T1 and E1 circuits
- Explain how to configure a bundle on T1E1 circuits
- Explain how to configure port settings for the T1 E1 bundle
- Explain how to activate and query a bundle

Module 12: CTP Bundle Configuration–Analog Voice

- List the different CTP modules that support analog voice circuits
- Explain how to configure a bundle on an analog voice circuit
- Explain how to query the bundle

Module 13: Hairpinning Bundles in CTP

- Describe and list the different bundle types in CTP
- Explain the configuration of hairpinning bundle

Module 14: Y-Cable Redundancy

- Explain the use of Y-cable redundancy option in CTP
- Explain the different modes of Y-cable redundancy
- Describe the process of setting up Y-cable redundancy option in CTP

Module 15: Clocking and Timing Options

- Define the clocking and timing options of CTP
- Explain the different DCE clock configuration options
- Explain the different DTE and T1E1 clock configuration options

Module 16: Adaptive Clocking Feature

- Explain adaptive clocking
- Explain and list the clock parameters
- Describe the network reference
- Describe the netref configuration in CTP

Module 17: CTP Buffering

- Describe the buffering options in CTP
- Explain the buffering configuration and settings in CTP

DAY 3

Module 18: CTP Bundle States and Troubleshooting

- Explain the bundle startup with run state configuration
- Describe how to collect logs and backup on CTP
- Examine the CTP dump file
- Explain different bundles and their query details

Module 19: Fundamentals of CTPView

- Explain the purpose of CTPView
- Explain the server interfaces of CTPView
- Explain the web interfaces of CTPView
- List functions of the server administration section of the CTPView application

Module 20: Components of CTPView, Part 1

- Explain the Bundle section of CTPView
- Explain the Node section of CTPView

Module 21: Components of CTPView, Part 2

- Explain the System section of CTPView
- Explain the Statistics section of CTPView
- Explain the Network section of CTPView

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